

Appendices to the background on AME Origin and Purpose

Appendix A : Effects of Shortage of AMEs

(1) Risks resulting from effects of Shortage of AMEs and incorrect training of AMEs on Canadian Business:

a) Certification of incorrectly selected, trained and qualified applicants:

- i. Only trained to be a mechanic (i.e A&P mechanic).
- ii. Not trained / qualified to be an Airworthiness inspector.
- iii. Not trained to supervise others.
- iv. Not trained to say NO, but instead will sign for anything, not trained to represent the Minister as a signatory.

b) Work gets performed incorrectly:

- i. repairs fail in service once out the door
- ii. people injured (or worse)

c) Incorrect / non-conforming materials are accepted and subsequently used:

- i. repairs fail in service once out the door
- ii. people injured (or worse)

d) Incomplete / inaccurate aircraft records are notarised by the AME:

- i. inability to verify who did what and when.
- ii. records retained are inaccurate or misleading
- iii. records reflect entire chapters were accomplished when this is not the case
- iv. records of work performed and certified by other organisations may not be on file (because most AMOs do not supply these detailed documents to the aircraft owner along with the Form One / 8130-3)
- v. Company may have to account for costs for work linked to them that they cannot refute.

e) Aircraft certified and returned to service that are not airworthy:

- i. foreign ramp check catches issue - aircraft grounded in foreign country.
- ii. Parts / material liberated from aircraft in flight i.e Blue Ice / Turbine engine parts / cowlings
- iii. incident occurs (injuries and property damage)
- iv. accident occurs (death and substantial property damage)

f) Impact to Company revenues:

- i. Buy-back / Warranty
- ii. Penalties for failing to meet on-time delivery
- iii. having to defend against Civil suits and Criminal cases

g) Impact to Company reputation:

- i. Bad work reputation
- ii. revolving door of employees coming / going
- iii. Good AMEs and AMTs do not want to work for you
- iv. errors not caught before delivery to customer
- v. TSB and similar reports made public

(2) Resulting Challenges to Canadian employers / businesses :

a) Locating qualified AMEs:

- i. ICAO equivalent is not what it appears to be. (ICAO says A&P = AME" this is false).
- ii. Canada' Immigration portal informs potential immigrants that an "A&P" will be acceptable for getting an AME.
- iii. Canada's HRDC NOC Codes for AMEs are inaccurate and merge the Mechanic with the Airworthiness Inspector.
- iv. Transport Canada program designed *with the intent* "to produce a fully qualified technician" (Canada's Federal Government is not allowed by BNA to qualify trades-persons) *"with the expectation* that they will fulfil the role of the AME" in Canadian aviation.
- v. Current Canadian College program focus has shifted from **training inspectors / certifiers** to *training trades-persons*.
- vi. Canadian Colleges graduating students for PROFIT, thus colleges may be lowering the standards for entry and graduation in order to attract potential students. Graduates must meet strict entry and graduation terms, no cheating accepted. Graduates must not be "certified" by the colleges as meeting TCCA standards as this is a conflict of interest identical to what has occurred in the USA in the mid 1990's and 2000's.
- vii. Potential for Canadian licensed AMEs to obtain a derogation / license in a foreign jurisdiction as an "inspector" and then inadvertently cause incident / accident on foreign registered aircraft due to improper training / licensing structure received in Canada.

b) In order to Ensure AMEs are properly trained and capable:

- i. Require college entrance requirements contain stipulations for "high-school technical education".
- ii. Require that colleges shift the level of academic & required for entry to a higher level.
- iii. Require College entrance requirements to mandate 75% or better in "Technical" english.
- iv. Require candidates for employment to hold provincial trades board issued "Aircraft Mechanic Certificates" issued subsequent to trades testing.
- v. Require and accomplish trades testing of applicants prior to certification
- vi. Require and accomplish english testing at an engineering level prior to certification.
- vii. Verify that the person is who they say they are and that their licenses are in fact legitimate. (i.e - Pakistan and counterfeit Pilot / AME license issues resulting from 737MAX investigations)

(3) Resulting Opportunities presented :

- A. Re-enforce Canada's AME training program and strengthen Canada's weakened position on Airworthiness Control.
- B. Canada can continue to Stand out above the crowd as a leader instead of a follower.

(4) strategies to effect significant cultural change regarding AMEs:

- A. Educate the AMEs as to what they truly are and of what is expected of them as license holders regarding Condition and Conformity Inspections for Airworthiness compliance.
- B. Show the AMEs that your bottom line as well as their paycheque and continued employment rides on them.
- C. Report ALL non-conformances and issues toed to "findings" reported or made in the company that are directly / indirectly linked to AME training and Licensing to TC because otherwise the company will spend tens of thousands of dollars trying to fix a problem it didn't create.

Appendix B : Potential Risks

Potential Risks resulting from the current TC accredited policy, standards, model of training / qualifying AMTs and AMEs in Canada:

1. Education of AMEs to fulfill the original intended role is undermined:

- Only trained to be a mechanic (i.e A&P)
- Not trained / qualified to be an Airworthiness inspector
- Not trained to supervise others
- Not trained to say no, but instead will sign for anything
- Not trained to act as a representative of the Minister.
- AMEs are currently viewed by the masses as "mechanics" performing trade's-work instead of being viewed as Highly educated and trained Professionals performing a regulated function as Certifying Inspecting Engineers, this needs to be addressed because aviation safety relies upon the AME as the final technical sign off before the pilot flies the aircraft.
- As Aeronautics Engineering knowledge advances , AMEs now get less and less of that knowledge with an expectation that they know more and more...
- AME's being allowed to certify aircraft of any size and complexity when they do not understand / fully comprehend the machine, its systems, its design specifications or the required regulatory standards to be met in order to certify it is compliant.
- No longer a progressive education and no pre-requisites or additional certification structure that requires AMEs to enter at a level commensurate with their knowledge & experience and then advance upwards or sideways.
- Results in Industry hiring incorrectly trained and qualified personnel.
- The wide ranging sizes and complexities of aircraft, engines and other aeronautical products on the Canadian Register require that considerable practical experience and theoretical knowledge is necessary prior to AME licensing to ensure that the licensed AME will not make serious mistakes for lack of knowledge of what they are doing.
- Business and aircraft owners seek to bypass the period of training and experience required for candidates to become thoroughly knowledgeable and then obtain AME licenses, and yet those businesses / aircraft owners and the public hold those candidates / license holders accountable when things go wrong.
- Once graduated from their basic training programs, candidate AMEs must have acquired sufficient general knowledge and experience to ensure that they are competent to judge whether aircraft of all types applicable to the license they seek to obtain are safe to fly.
- The Public sees newly licensed AMEs with the same eyes it sees seasoned and knowledgeable AMEs, therefore the public demands that candidate AMEs require intimate knowledge of the particular type of aircraft or engine etc. for which their licence is to be rated / endorsed.
- The Public expects that the candidate AME must have maintained the particular type of aircraft for which his licence not only as a "Certified Competent Technician" as a prerequisite to holding an AME License, but that the candidate has also; in addition, separately accomplished and recorded the accomplishment of the specific duties and responsibilities of an AME related to supervision, inspection and certification of those maintenance tasks. However there is no differentiation made in candidate logbooks of "Maintenance Performed" vs "oversight inspection performed" tasks

2. Perception of AMEs by NON-AMEs / other Professionals is diminished or altered:

- Educators teach incorrect information in Colleges and Universities about the role and responsibilities of AMEs
- Government employees incorrectly edit or alter department documents related to policy, standards or definitions.
- Government's Translation Bureau terms and definitions reflect inaccurate information.
- Immigration Policies and Labour Relations references are impinged, degraded or incorrect.

3. Maintenance Work gets performed incorrectly without being corrected:

- repairs fail prior to delivery to customer and require rework
- repairs fail in service once out the door and require warranty work
- people injured (or worse) when repairs are incorrectly performed and certified.
- Incorrect / non-conforming materials are used:
- repairs fail in service once out the door • people injured (or worse) .
- Incomplete / inaccurate aircraft records are notarised by the AME:
- inability to verify who did what and when.
- records are misleading
- records reflect entire chapters were accomplished when this is not the case
- records of work performed and certified by other organisations may not be on file (because most AMOs do not supply these detailed documents to the aircraft owner along with the Form One / 8130-3)
- Company may have to account for costs for work linked to them that they cannot refute.
- TSB and other investigators are increasingly unable to obtain full details from aircraft owner of exactly what maintenance was performed / parts used / maintenance references used etc. in order to conduct effective investigations when components have failed or other work was subsequently accomplished during installation.

4. Aircraft returned to service that are not / may not be airworthy:

- foreign ramp check catches issue - aircraft grounded in foreign country.
- Parts / material liberated from aircraft in flight i.e Blue Ice / Turbine engine parts / cowlings
- incident occurs (injuries and property damage) • accident occurs (death and substantial property damage)
- 6. Impact to private Company revenues:
 - Buy-back / Warranty • Penalties for failing to meet on-time delivery • Revenue lost to cover restitutions imposed by legal judgements / rulings • Bankruptcy
- 7. Impact to private Company reputation:
 - Bad work reputation • revolving door of employees coming / going • errors not caught before delivery to customer. • Consumer loses confidence that company is compliant, takes work elsewhere.

5. Impact to Government of Canada / Transport Canada / Minister of Transport

- Failed Government policy,
- Lack of control over internal staff advising the minister and others
- Errors not caught by AMEs as intended by legislation before accidents happen.
- Loss of public trust in Parliament & Transport Canada to control airworthiness.
- Loss of trust in Canada's Aviation Safety program.
- Exclusion of Canadian aircraft into foreign airspace due to concerns of foreign regulators over airworthiness of Canadian aircraft / products.

Appendix C : Opportunities presented to support and reinforce the AME

Opportunities presented for Improvement to Canada's AME training programs:

1. Introduce a 2 stage training and licensing structure for Canadian AMEs:

a) Aircraft mechanic / AMT 1st, - a mandatory pre-requisite - with a defined period of time between obtaining the AMT certificate before they can attend AME training. - In the exact same manner as American A&P's.

b) AME 2nd, in the exact same manner as American DAR-Ts / DAR-F (I.A's)

2. Introduce the term "Licensed AME" into the Aeronautics Act, Section 3 Interpretation and and define it correctly: "Means a Minister's Delegated Airworthiness Inspection Representative having responsibility and authority for the airworthiness inspection and and certification of aircraft and aeronautical products during manufacturing and/or maintenance operations.

Similar to the U.S.A, allow AMEs to negotiate the fee they charge for their services in addition to their wages if they also work as certificated AMTs.

3. Introduce the term "Licensed AME" into CARs PART 1, Subpart 1 Section 101.01 and define it correctly: "Means a Minister's Delegated Airworthiness Inspection Representative having responsibility and authority for the airworthiness inspection and and certification of aircraft and aeronautical products during manufacturing and/or maintenance operations".

4. Introduce the term "AMT" into CARs PART 1, Subpart 1 Section 101.01 and define it correctly: "Means a Trades-person (mechanic) Certified Competent to perform aircraft maintenance and repair in preparation for inspection and certification"

5. Introduce firm, standards, policies and procedures to be met by candidate Aviation Maintenance technicians (AMT's) within CARs and authorise that post training certification to those standards etc is to be accomplished by Provincial Trade Boards to harmonized RED Seal standards and that aviation maintenance trade's certificates are to be issued by the Provinces to those who successfully pass their Provincial oral, practical and theoretical trade testing exams.

6. Define and implement higher academic and technical background standards to be met by persons seeking entry into a Canadian Aviation Maintenance technician (AMT) training programs out of Canadian high-schools or as direct entry candidates.

7. Define and implement higher academic and technical background standards to be met by persons seeking entry into a Canadian Aviation Maintenance Engineer (AME) training programs out of Canadian Colleges and Universities or as direct entry candidates from industry.

8. Properly re-establish the AME as a proper "Airworthiness Inspection Representative" / A.I.R and Ministers (external) delegate.

9. Clearly define the specific roles / responsibilities of the AMEs as delegated persons having responsibility and authority for the airworthiness inspection and certification of aircraft and aeronautical products during manufacturing and/or maintenance operations.

10. Due to "Mechanics" now training AME candidates to become "Mechanics", require that the candidates for an AME license must receive - in addition to their theoretical education as AMEs, hands-on OJT training as "*Supervisors, Condition and Conformity Inspectors, delegates and notaries*" **and** successfully complete a certain number of mandatory required **condition / conformity / first article inspections** within manufacturing and/or maintenance environments (depending upon the rating sought) under the direct supervision of an AME properly educated and certified to act in the correct capacity.

11. Re-introduce a candidates handbook for the AMEs that specifies what they can and cannot do. Also, introduce written contract to be signed between the Minister and the Delegate clearly defining what the licensed delegate is accountable and responsible for including the full terms of and extent of their authority.

12. Enable the AMEs to charge or otherwise negotiate a fee for their services with their employers by recognition of their Professional "Delegated Airworthiness Representative" status in the exact same manner that the USA allows for its' DARs to be compensated for their work.

13. To directly reflect their American counterpart, re-identify the Canadian term for Design Engineering Representatives to "DE" and not DAR as is currently the case.

14. Define the Canadian DAR to directly and correctly reflect its American counterpart.

15. Re-enforce Canada's AME training program and strengthen Canada's weakened position on internal Airworthiness condition and conformance control.

16. Stand out above the crowd as a leader instead of a follower and take positive action to support Canada's AMEs as "CASI's-Private" in support of Canada's commitment to ICAO's framework for airworthiness which requires these license holders to be in place.

17. Re-define the term "Maintenance" to exclude "Inspection" and any references to "Inspection certification". Inspection is inspection but "maintenance" is work that is done in order to prepare an aircraft or aeronautical product for inspection.

18. Require that the TSB sanitise, but report out on ALL issues effecting aviation safety including information gleaned during TSB laboratory analysis of repairs made by Canadian certificate holders and subsequently inspected / certified by Delegates.

19. Alert the Treasury that "TI's within the Minister's office doing Civil aviation related work need to be identified as requiring both an AMT certificate of competency as well as an AME License.

20. if the Candidate for an AME candidate is a Military trades'-person, that they take the same AME training as all other AMEs and accomplish OJT in the capacity of a civilian inspection delegate before they are issued a license.

21. Amend the current CAR 566.07 Alternative Training Provisions respecting "Foreign Applicants" to state "Foreign Applicants who HOLD a valid Delegated Airworthiness Representative "Inspection Authorization" issued by the US Federal Aviation Administration,

are exempt from the basic training requirement specified in Appendix A but must keep their I.A active"

Appendix D : Strategies to effect significant cultural change

Strategies to effect significant cultural change within Government, Industry and the Public regarding AMEs:

1. Educate the AMEs as to what they truly are and of what is expected of them as delegated license holders regarding Condition and Conformity Inspections for Airworthiness compliance.
2. Support the meshing of AME training at the College level with the University Engineering education so that there is a clear link and ability for upward progression for AMEs to attend University level courses ,
3. Require Licensed AMEs to become members of an "Professional Aeronautical Engineer's Association" (which must not be a trades' union or a trade's union association) that is supported and acknowledged by the Provincial Engineering associations to enable the AMEs to progress onwards to earn a "P.Eng in Aeronautics" as an additional credential once they have successfully:
 1. graduated their basic training College programme,
 2. obtained the AME license and
 3. have satisfied additional education requirements which should be offset by their type training and years of experience.
4. Require Canadian programs of "University Level Aeronautical Engineering" that further develop AMEs to:
 - A. recognise the AME license(s), experience and type training, and
 - B. be delivered on-line thru recognised / accredited Universities distance education programs..
4. Show the AMEs that their private employer's bottom line as well as their paycheque and continued employment rides on the AMEs themselves.
5. Amend the current TC SMS policy to require all SMS participants to report ALL non-conformances and issues related to "findings" reported or made in the company that are directly / indirectly linked to AME training and Licensing to TC.
6. Amend current TC SMS policy to reflect that TC, as an employer of "Delegates" must also adhere to its own SMS policies for TC's "external" Employees - the Minister's delegates..
7. Require TC to prepare and deliver ongoing refresher and update training to AME license holders specific to:
 - a) Aeronautics Act and CARs
 - b) TC Regulations, Policy, Standards, Ministers MSI's,
 - c) the AME's role and function as a Ministers' delegate for Airworthiness inspection and certification and d) the requirement for AMEs to adhere to regulatory standards etc.

8. Similar to the USA for it's I.A's / DAR-T and DAR-Fs, publish a monthly or semi-monthly list of Valid / Active AMEs (not AMTs) that is publicly visible and tied into their 2 year refresher training courses which must be delivered by or acceptable to the Minister.

9. Publish detailed factual information that identifies and establishes the legal origin and evolution of the AME stemming from the British birth-certificate as "Aeronautical (Ground) Engineers" in 1919 thru the change in terminology used by the Canadian Air Board in 1920 as "Air Engineers" to the subsequent re-naming of Canada's Air Engineers in 1946 to today's Licensed Aeronautical (maintenance) Engineer to today's Licensed Aircraft Maintenance Engineer.

Require that this important background information be included and taught:

- a) to both AMTs and AMEs in order to better reinforce the AME program, and
- b) to the public that they can correctly understand and trust the AME program.